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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,894	11/23/2001	Bahram Javidi	UCT-003	7643

23413 7590 10/24/2007
CANTOR COLBURN, LLP
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BLOOMFIELD, CT 06002

EXAMINER

DINH, MINH

ART UNIT	PAPER NUMBER
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2132

MAIL DATE	DELIVERY MODE
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10/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

4A

Office Action Summary	Application No.		Applicant(s)	
	09/993,894		JAVIDI ET AL.	
	Examiner		Art Unit	
	Minh Dinh		2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 26-28 and 31-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 26-28 and 31-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the RCE/amendment filed 08/17/07.

Claims 1, 26 and 31 have been amended.

Response to Arguments

2. Applicant's arguments filed 08/17/07 have been fully considered but they are not persuasive. Applicant argues that Marom et al. ("Analysis of Spatial-Temporal Converters for All-Optical Communication Links") does not teach sampling data in the spatial domain after the data has been received and converted to the spatial domain. Marom discloses that received data is converted to the spatial domain (i.e., data is spectrally decomposed by the input grating combined with a spatial Fourier transform lens producing the spatially dispersed spectrum on the Fourier plan 2) (page 2862, right column, bottom) and is sampled (i.e., the location of the signal of each data point at plan 3 is measured at $x^{\dagger} = -n\Delta(\lambda_r/\lambda_w)$ where Δ is the spatial separation between adjacent point sources in the data array, λ_r is the wavelength of the read out cw beam at the receiving side, and λ_w is the cw wavelength used at the transmitting side) (page 2860, left column, last paragraph; page 2863, right column, 4th paragraph).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what the structures corresponding to the means plus function limitations are in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-16, 26-28 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Javidi et al (5,903,648) in view of Marom et al. ("Analysis of Spatial-Temporal Converters for All-Optical Communication Links").

Regarding claim 1, which is exemplary of claims 26 and 31, Javidi discloses a method for encrypting optical images. Javidi further discloses

that an image is optically encrypted, and that the resulting encrypted data is stored and read out in the spatial domain (Abstract; col. 3, lines 16-60; fig. 7). Javidi also discloses transmitting the encrypted data in the spatial domain, receiving and decrypting the encrypted data to recover the image (fig. 16).

Javidi disclose transmitting the data in the spatial domain. Javidi does not disclose converting the data from the spatial domain to the temporal domain prior to transmission, converting the converted data to the spatial domain at reception, and sampling data in the spatial domain at both transmitting and receiving ends.

Marom discloses an optical communication method in which data is converted from the spatial domain to the temporal domain prior to transmission, transmitted and converted from the temporal domain to the spatial domain at reception (Abstract; figures 1-2; Section 2, pages 2859-2863).

Marom also discloses that sampling data in the spatial domain at the transmitting end based on a value Δ being the spatial separation between adjacent point sources in a data array (page 2860, left column, last paragraph).

Marom further discloses that received data is converted to the spatial domain (i.e., data is spectrally decomposed by the input grating combined

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with a spatial Fourier transform lens producing the spatially dispersed spectrum on the Fourier plan 2) (page 2862, right column, bottom) and is sampled (i.e., the location of the signal of each data point at plan 3 is measured at $x^{\dagger} = -n\Delta(\lambda_r/\lambda_w)$ where Δ is the spatial separation between adjacent point sources in the data array, λ_r is the wavelength of the read out cw beam at the receiving side, and λ_w is the cw wavelength used at the transmitting side) (page 2863, right column, 4th paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Marom method of communication into the Javidi method of transmitting encrypted data such that the data is converted from the spatial domain to the temporal domain prior to transmission, transmitted and converted from the temporal domain to the spatial domain at reception. The motivation for doing so would have been to increase the bandwidth of a fiber-optic communication link (Abstract).

Regarding claims 2, 6, 27 and 32, Marom further discloses conversion of ultrashort light pulses which meet the limitation of ultrafast laser pulses (Abstract; fig. 1, page 2858, left column).

Regarding claims 3-4, 33 and 35, Marom further discloses conversion of ultrashort pulses spread in the spatial domain using diffraction and

according to their spectral components (fig. 1; page 2860, left column, last paragraph).

Regarding claim 5, Marom further discloses an optical network for transmitting the converted data (Title; Abstract).

Regarding claims 7-8 and 28, Javidi further discloses that the optical encryption includes double random phase encryption (Abstract).

Regarding claim 9, Javidi further discloses that the double random phase encryption includes phase encryption in the spatial domain and phase encryption in the frequency domain (col. 3, lines 16-38).

Regarding claim 10, Javidi further discloses storing of encrypted data comprises holographically storing said encrypted data (fig. 3).

Regarding claims 11, 13 and 34, Marom further discloses forming a real-time hologram using read-out data and a reference beam, reading out the real-time hologram, and converting the read-out hologram from the spatial domain to the temporal domain (fig. 1; page 2860, left column, last paragraph).

Regarding claims 12, 14, Marom further discloses that reading out the real-time hologram comprises directing a diffracted ultrashort pulse at the real time hologram (fig. 1; page 2860, left column, last paragraph).

Regarding claims 15-16, Javidi further discloses that decryption includes phase decoding in the spatial domain and in the frequency domain (col. 3, lines 39-60).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Dinh whose telephone number is 571-272-3802. The examiner can normally be reached on Mon-Fri: 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MD/
Minh Dinh
Examiner
Art Unit 2132

10/22/07


Benjamin G. Lanier
Examiner AU 2132